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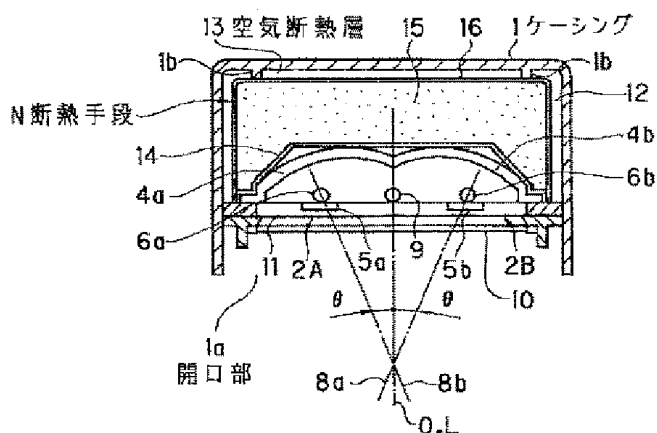
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(54)【発明の名称】 輻射熱温度センサ

(57)【要約】

【目的】比較的簡素な構成で、ケーシングの大型化やコストアップを抑制して、侵入する熱的外乱の絶対量を抑える断熱機能と、一対の温度センサへの影響度を均一にする均熱機能とを保持でき、検知精度の向上化を図れる輻射熱温度センサを提供する。

【構成】前面が壁面・床面等に対向して開口するケーシング1内に、壁面・床面等が保有する輻射熱エネルギーを互いに隣接する方向から指向して集熱し温度検知する互いに並設された一対の輻射熱検知部2A, 2Bを収容し、これら輻射熱検知部の検出面を除く周面と上記ケーシング内周面との間に、少なくとも空気断熱層13を備えた断熱手段Nを介在した。



**【特許請求の範囲】**

**【請求項1】** 前面が壁面・床面等に対向して開口するケーシングと、

このケーシング内に収容され、壁面・床面等が保有する輻射熱エネルギーを互いに隣接する方向から指向して集熱し温度検出する互いに並設された一対の輻射熱検知部と、

これら輻射熱検知部の検出面を除く周面と上記ケーシング内周面との間に介在され、少なくとも空気断熱層を備えた断熱手段とを具備したことを特徴とする輻射熱温度センサ。

**【発明の詳細な説明】****【0001】**

**【産業上の利用分野】** 本発明は、たとえば空気調和機に備えられ、空調制御をなすため、被空調室の壁面や床面からの輻射熱温度を検知する輻射熱温度センサに関する。

**【0002】**

**【従来の技術】** 空気調和機には、室内ユニットのたとえば前面下部に輻射熱温度センサを取付け、被空調室の壁面や床面から輻射される熱を赤外線光として捕らえ、壁面や床面の温度を間接的に検出して、その検知温度を空調制御に加えるものがある。

**【0003】** はじめ、この輻射熱温度センサは、限られた一方向の箇所の温度しか捕らえることができなかったが、近時、所定範囲の輻射熱を集める集熱手段として、一対の輻射熱検知部を並設し、左右もしくは上下の視野を独立させて、広範囲の箇所の温度を検出するものが開発されている。

**【0004】** 上記輻射熱検知部は、反射板と受熱板および一対の温度センサとから構成されるが、全ての構成部品は機械的強度が小さいから、保護をなす必要がある。すなわち、前面が開口する、剛体としてのケーシング内に収容され、その検出面を開口部に対向させている。

**【0005】**

**【発明が解決しようとする課題】** ところで、被空調室における壁面・床面等からの輻射熱エネルギーは、必ずしも輻射熱温度センサの検出面ばかりでなく、ケーシングの外周面からも輻射熱検知部に熱影響を及ぼす。このような、ケーシング外周面から侵入する熱的外乱は大きなノイズとなり、各温度センサにおける検出輻射温度の絶対値の誤差となる。

**【0006】** そのため、ケーシング自体を断熱構造とするか、もしくはケーシングと検出面を除く輻射熱検知部との間を断熱構造として、検知精度の確保を図る必要がある。具体的には、上記ケーシングの前面開口部を除く、外周面全てに亘って断熱材を貼着する構造、もしくは、ケーシングと輻射熱検知部との間を大きな空間部にして、ここに断熱材を充填する構造がある。

**【0007】** しかるに、ケーシング周面を断熱材で覆う

と、このセンサを空気調和機本体に取付け固定し難くなる。また、ケーシングと輻射熱検知部との間に断熱材を充填する場合は、必要な断熱効果を得るために、充分な量の断熱材を充填しなければならず、そのためケーシングを大型にしなければならない。ケーシングの寸法を抑制すれば、充分な量の断熱材を充填できなくなる。いずれにしても、そのための材料費と、工数が増大し、コストアップの要因となる。

**【0008】** 本発明は、上記の事情を考慮してなされたものであり、その目的とするところは、比較的簡素な構成で、ケーシングの大型化やコストアップを抑制して、侵入する熱的外乱の絶対量を抑える断熱機能と、一対の輻射熱検知部への影響度を均一にする均熱機能とを保持でき、検知精度の向上化を図れる輻射熱温度センサを提供することにある。

**【0009】**

**【課題を解決するための手段】** 上記目的を満足するため、本発明は、前面が壁面・床面等に対向して開口するケーシングと、このケーシング内に収容され、壁面・床面等が保有する輻射熱エネルギーを互いに隣接する方向から指向して集熱し温度検知する互いに並設された一対の輻射熱検知部と、これら輻射熱検知部の検出面を除く周面と上記ケーシング内周面との間に介在され、少なくとも空気断熱層を備えた断熱手段とを具備したことを特徴とする輻射熱温度センサである。

**【0010】**

**【作用】** 断熱手段としての空気断熱層は、各輻射熱検知部に対して侵入してくる熱的外乱を効率よく阻止して、各輻射熱検知部相互の均熱機能を保持し、検知する輻射温度の絶対値誤差を低減させる。

**【0011】**

**【実施例】** 以下、本発明の一実施例を、たとえば空気調和機本体内に収容される輻射熱温度センサとして、図面を参照して説明する。

**【0012】** 図中1は、矩形箱状に形成され、前面側に開口部1aを有するケーシングであり、この内部で、かつ開口部1aに対向して、一対の輻射熱検知部2A、2Bが並設される。

**【0013】** 上記輻射熱検知部2A、2Bは、図において水平方向に左右に並んで一体に連設され、互いに凹状に曲成される一対の反射鏡4a、4bと、これら反射鏡4a、4bの焦点位置近傍に配置される受熱板5a、5bと、各受熱板5a、5bにそれぞれ取着される温度センサ6a、6bおよび、これら温度センサ6a、6bの焦点位置外に設けられる基準温度センサ9とから構成される。

**【0014】** 上記反射鏡4a、4bの周端部は押さえ板7で固定され、かつそれぞれの反射鏡4a、4bは、たとえば同一の曲率の放物面鏡であり、金属薄板のプレス成形品、もしくは樹脂成形品を、表面メッキ処理して得

られる。

【0015】互いに、軸心8a、8bは中心位置に対して、同角度θ、互いに内側に傾斜され、各反射鏡4a、4bの連結位置から延長される中心軸O、L上の一点で交差するよう、左右方向に異なる指向性が持たされる。

【0016】したがって、反射鏡4a、4bとしての視野範囲は、ケーシング開口部1a前面で大きく交差するが、これら相互の連結部に沿う縁線が事実上の熱境界線となり、各反射鏡4a、4b自体、熱的に分離された状態となっている。上記受熱板5a、5bは、ここでは円板状であり、それ自体の熱容量を低減するため、たとえばガラエポの薄板で形成される。

【0017】この裏面側である反射鏡4a、4bの鏡面对向側に、輻射熱を検知する上記温度センサ6a、6bが熱伝導性接着剤を用いて接着固定される。これら温度センサ6a、6bの信号出力を、温度センサ6a、6bに接続されるリード線によって取り出す構成としている。

【0018】上記温度センサ6a、6bは、細長いブリッジ固定体10に支持される受熱板5a、5bに取り付けられているから、受熱板5a、5bとともに空中に浮いた状態となり、熱伝導による影響が極く少なくてすむ。

【0019】上記輻射熱検知部2A、2Bを収容するケーシング1の前面開口部1aは、たとえば厚さ100μm程度のポリエチレンシートからなる赤外線透過膜11で閉塞される。このことから、ケーシング1内へは赤外線のみ透過され、外界の吹出気流などの影響が、受熱板5a、5bおよび温度センサ6a、6b等に及ぶことはない。

【0020】赤外線透過膜11によって遮蔽される輻射熱検知部2A、2B内で、かつ左右の反射鏡4a、4bの焦点を通る軸線8a、8bとは外れた位置に、この空間部の温度を検知する上記基準温度センサ9が設けられる。

【0021】この場合、各受熱板5a、5bに取着される温度センサ6a、6bは、左右の輻射熱エネルギーを受けるのに対して、基準温度センサ9は、位置の設定から輻射熱エネルギーを受けない。

【0022】このようにして構成される輻射熱検知部2A、2B裏面側とケーシング1の開口部1aを除く内周面との間には、断熱手段Nとしての断熱体12および空気断熱層13が介設される。

【0023】上記断熱体12は、左右の反射鏡4a、4bの裏面側に沿うよう、たとえばプレス加工された均熱板14を設け、この裏面側に断熱材15を重ね、さらにこの断熱材15の周囲を覆うとともにケーシングの開口部を除く内周面と所定の間隔を存するよう、たとえばプレス加工された別の均熱板16からなる。

【0024】すなわち、2枚のプレス加工をなした均熱

板14、16相互を組み合わせて、内部空間を有する変形した箱体を形成し、その内部空間に断熱材15を充填して、均熱板14、16相互の周縁を固着した構造である。

【0025】上記ケーシング1の内面側には、同一の突出量に形成されたリブ1b…が、一体に設けられていて、これらリブ1b…の端縁に外側の上記均熱板16が当接する。したがって、均熱板16はケーシング1の内面側と所定の間隔を存し、これら間隔が上記空気断熱層13として形成されることとなる。

【0026】このようにして構成される輻射熱温度センサは、たとえば空気調和機の室内ユニットに取付けられる。上記輻射熱検知部2A、2Bの構成から、これらの視野範囲は、室内ユニットの正面から見て左右に振り分けられ、側面から見た状態では一致する。

【0027】しかして、被空調室における壁面や床面から熱が輻射されると、その輻射熱エネルギーが赤外線光となって、輻射熱温度センサに投射される。さらに述べれば、壁面および床面における、左右にスポット状に並んだ視野範囲から、室内ユニット内の輻射熱温度センサへ輻射熱エネルギーが投射される。赤外線光となった輻射熱エネルギーは、赤外線透過膜11を透過して反射鏡4a、4bに投射され、ここで焦点位置に絞込まれた状態で反射する。

【0028】反射鏡4a、4bで反射された輻射熱エネルギーは、受熱板5a、5bに集中して取り込まれ、温度センサ6a、6bに伝わる。それぞれの温度センサ6a、6bが検知する温度は、リード線を通して外部に信号出力される。

【0029】このような輻射熱温度センサSの視野範囲は、ここでは左右に並んで配置された互いの反射鏡4a、4bの軸心8a、8bの傾き角度と、放物面鏡としての曲率、受熱板5a、5bの直径面積および反射鏡4a、4bと受熱板5a、5bとの距離間隔を種々設定することにより、自由に調整可能である。

【0030】特に、各温度センサ6a、6bは、受熱板5a、5bとともに空中に浮いた状態で配置され、かつ赤外線透過膜11によりケーシング1内の同一空気層にあるので、たとえ外部の熱影響があっても、同じように影響を受けることとなり、左右差の検知精度を高く保持できる。

【0031】上記基準温度センサ9は、同一空間部内で外界からの熱影響が均一な条件下において、上記温度センサ6a、6bが検出する左右視野範囲の輻射熱エネルギー量の差として検出することができ、相対精度の高い検出値が得られる。

【0032】また、壁面および床面から室内ユニット内へ投射される輻射熱エネルギーの一部は、輻射熱温度センサを構成するケーシング1の外周面から内部へ、熱的外乱として侵入する。

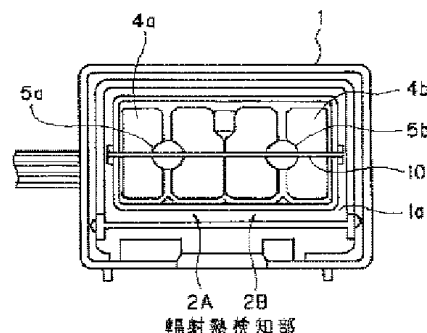
【0033】しかしながら、ケーシング1内には空気断熱層13が形成されており、ここでそのほとんどが断熱される。すなわち、空気断熱層13は侵入してくる熱的外乱の絶対量を抑制し、各温度センサ6a、6bへの熱影響を均一にする均熱機能を発揮する。

【0034】この空気断熱層13と輻射熱検知部2A、2Bとの間には、断熱体12を構成する均熱板14、16および、これら均熱板14、16に充填される断熱材15が介在するから、輻射熱検知部2A、2Bに及ぼす熱的外乱は無視できる程度に低減する。

【0035】この輻射熱温度センサは、断熱機能として、侵入してくる熱的外乱の絶対量を無視できる程度に抑制し、均熱機能として、左右の輻射熱検知部2A、2Bへの影響度を均一化する作用をなす。したがって、常に、極めて高い検知精度が得られることとなる。

【0036】なお、上記実施例におけるリップ1bの突出量は、実際のもので、2mm程度あればよく、すなわち、ここに形成される空気断熱層13の最適な厚さでもある。この空気断熱層13の厚さは、必要以上に厚くすることはない。たとえば、5mm以上ある厚い空気層とすると、熱対流が生じ易く、かえってマイナス効果となるの

【図1】



で、注意が必要となる。

【0037】これはまた、ケーシング1の大型化を阻止する要素にもなり、実際には、ケーシング1の内面にリップ1bを一体に設けるだけでよいから、材料費および工数にほとんど影響がない。

【0038】

【発明の効果】以上述べたように、本発明は、一対の輻射熱検知部の検出面を除く周面とケーシング内周面との間に、少なくとも空気断熱層を備えた断熱手段を介在したから、比較的簡素な構成で、ケーシングの大型化やコストアップを抑制して、侵入する熱的外乱の絶対量を抑える断熱機能と、一対の温度センサへの影響度を均一にする均熱機能とを保持でき、検知精度の向上化を図れる効果を奏する。

【図面の簡単な説明】

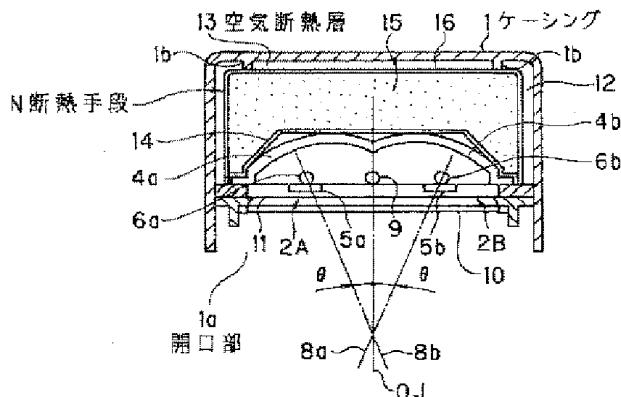
【図1】本発明の一実施例を示す、輻射熱温度センサの正面図。

【図2】同輻射熱温度センサの横断平面図。

【符号の説明】

1…ケーシング、2A、2B…輻射熱検知部、12…断熱体、13…空気断熱層、N…断熱手段。

【図2】



# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : TOSHIBA CORP

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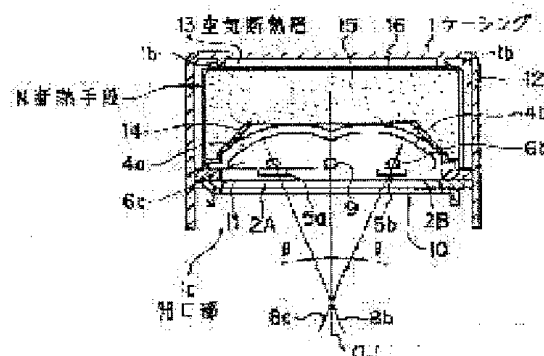
(72)Inventor : KUMAGAI NOBORU  
SATO KAZUHISA

## (54) RADIATION HEAT TEMPERATURE SENSOR

### (57)Abstract:

**PURPOSE:** To obtain a radiation heat temperature sensor in which detection accuracy can be enhanced by restraining increase of cost and the size of casing through a relatively simple structure while sustaining thermal insulation function for suppressing absolute value of thermal disturbance and uniform heating function for making uniform the effect on a pair of temperature sensors.

**CONSTITUTION:** A pair of radiation heat detecting parts 2A, 2B for directing radiation heat energy on the wall face, floor face, or the like from adjacent directions to collect heat and detect temperature are juxtaposed in a casing 1 having open front face opposing to the wall face, floor face, or the like. A thermal insulation means N provided at least with an air thermal insulation layer 13 is placed between the inner peripheral face of the casing and the peripheral face at the radiation heat detecting part except the detecting face thereof.



## LEGAL STATUS

[Date of request for examination]

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[Claim(s)]

[Claim 1] The radiant heat detection section of the pair which points to the radiant heat energy which holds in casing which a front face counters a wall surface, a floor line, etc., and carries out opening, and this casing, and a wall surface, a floor line, etc. hold from the direction which adjoins mutually, carries out a collection of heat and carries out temperature detection and which was installed mutually, The radiant heat temperature sensor characterized by providing the heat insulation means which intervened between the peripheral surfaces and the above-mentioned casing inner skin except the detection side of these radiant heat detection section, and was equipped with the air thermal break at least.

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[Translation done.]

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] In order that an air conditioner may be equipped with this invention and it may make air-conditioning control, it relates to the radiant heat temperature sensor which detects the radiant heat temperature from the wall surface and floor line of an air conditioned room-ed.

[0002]

[Description of the Prior Art] A radiant heat temperature sensor is attached for example, in the front lower part of an indoor unit, the heat radiated from the wall surface and floor line of an air conditioned room-ed is caught in an air conditioner as an infrared light, the temperature of a wall surface or a floor line is indirectly detected to it, and there are some which apply the detection temperature to air-conditioning control in it.

[0003] At first, although this radiant heat temperature sensor became unable to catch only the temperature of the part of the limited one direction, install the radiant heat detection section of a pair as a collection-of-heat means to collect the radiant heat of the predetermined range, the visual field of right and left or the upper and lower sides is made to become independent recently, and what detects the temperature of a wide range part is developed.

[0004] Although the above-mentioned radiant heat detection section consists of a reflecting plate, a heat-receiving plate, and a temperature sensor of a pair, since the mechanical strength is small, it is necessary to protect all component parts. That is, it holds in casing as the rigid body in which a front face carries out opening, and the detection side is made to counter opening.

[0005]

[Problem(s) to be Solved by the Invention] By the way, the radiant heat energy from the wall surface, floor line, etc. in an air conditioned room-ed not necessarily has a thermal effect on the radiant heat detection section not only from the detection side of a radiant heat temperature sensor but from the peripheral face of casing. The thermal disturbance which invades from such a casing peripheral face serves as a big noise, and serves as an error of the absolute value of the detection radiation temperature in each temperature sensor.

[0006] Therefore, it is necessary to make the casing itself into a thermal protection structure, or to aim at reservation of detection precision by making between casing and the radiant heat detection sections except a detection side into a thermal protection structure. Between the structure except front opening of the above-mentioned casing which covers all peripheral faces and sticks a heat insulator, or casing and the radiant heat detection sections is specifically made into the big space section, and there is structure filled up with a heat insulator here.

[0007] However, this sensor is attached in an air-conditioner body with a wrap with a heat insulator, and it is hard coming to fix a casing peripheral surface. Moreover, when filled up with a heat insulator between casing and the radiant heat detection section, in order to acquire required adiabatic efficiency, it must be filled up with sufficient quantity of a heat insulator, therefore casing must be made large-sized. If the dimension of casing is controlled, it will become impossible to be filled up with sufficient quantity of a heat insulator. Anyway, a man day



increases with the cost of materials for it, and it becomes the factor of a cost rise.

[0008] This invention is made in consideration of the above-mentioned situation, the heat insulation function the place made into the purpose is a comparatively simple configuration, controls enlargement and a cost rise of casing, and stop the absolute magnitude of the invading thermal disturbance, and the soak function which makes homogeneity whenever [ effect / of the radiant heat detection section on a pair ] can be held, and it is for providing about the radiant-heat temperature sensor which can be planned in improvement-ization of detection precision.

[0009]

[Means for Solving the Problem] Casing which a front face counters a wall surface, a floor line, etc., and carries out opening of this invention in order to satisfy the above-mentioned purpose, The radiant heat detection section of the pair which points to the radiant heat energy which holds in this casing and a wall surface, a floor line, etc. hold from the direction which adjoins mutually, carries out a collection of heat and carries out temperature detection and which was installed mutually, It is the radiant heat temperature sensor characterized by providing the heat insulation means which intervened between the peripheral surfaces and the above-mentioned casing inner skin except the detection side of these radiant heat detection section, and was equipped with the air thermal break at least.

[0010]

[Function] The air thermal break as a heat insulation means prevents efficiently the thermal disturbance which invades to each radiant heat detection section, and reduces the absolute value error of the radiation temperature which holds and detects the soak function between each radiant heat detection section.

[0011]

[Example] Hereafter, one example of this invention is explained with reference to a drawing as a radiant heat temperature sensor held for example, in an air-conditioner body.

[0012] One in drawing is formed in rectangle box-like, it is casing which has opening 1a in a front-face side, and is this interior, and opening 1a is countered, and radiant heat detection section 2A of a pair and 2B are installed.

[0013] The reflecting mirrors 4a and 4b of the pair which above-mentioned radiant heat detection section 2A and 2Bs are horizontally formed successively by one together with right and left in drawing, and is mutually curved by the concave, It consists of heat-receiving plates 5a and 5b arranged near the focal location of these reflecting mirrors 4a and 4b, and the temperature sensors 6a and 6b attached in each heat-receiving plates 5a and 5b, respectively and the reference-temperature sensor 9 formed outside the focal location of these temperature sensors 6a and 6b.

[0014] The peripheral edge section of the above-mentioned reflecting mirrors 4a and 4b is fixed with the presser-foot plate 7, and it is the parabolic mirror of the same curvature, and each reflecting mirror 4a and 4b carries out surface plating processing of the press-forming article or resin mold goods of a metallic thin plate, and is obtained, for example.

[0015] Mutually, to a center position, directivity which is different in a longitudinal direction can give axial centers 8a and 8b so that it may cross by whenever [ isogonism / theta ] and 1 on medial-axis O.L which inclines inside mutually and is extended from the connection location of each reflecting mirrors 4a and 4b.

[0016] Therefore, although the visual field range as reflecting mirrors 4a and 4b crosses greatly in the front face of casing opening 1a, the bridle wire in alignment with the connection section mutual [ these ] turns into a de facto heat boundary line, and it is in each reflecting mirror 4a, the 4b itself, and the condition of having dissociated thermally. The above-mentioned heat-receiving plates 5a and 5b are disc-like here, and they are formed with the sheet metal of GARAEO in order to reduce the heat capacity of itself.

[0017] Adhesion immobilization of the above-mentioned temperature sensors 6a and 6b which detect radiant heat is carried out at the mirror plane opposite side of the reflecting mirrors 4a and 4b which are these rear-face sides using thermally conductive adhesives. The signal output of these temperature sensors 6a and 6b is considered as the configuration taken out with the lead wire connected to temperature sensors 6a and 6b.

[0018] the effect the above-mentioned temperature sensors 6a and 6b will be in the condition of having floated in the air with the heat-receiving plates 5a and 5b since it was attached in the heat-receiving plates 5a and 5b supported by the long and slender bridge fixed object 10, and according to heat conduction — \*\*\*\* — it is few and ends.

[0019] Above-mentioned radiant heat detection section 2A and front opening 1a of casing 1 which holds 2B are blockaded by the infrared transparency film 11 which consists of a polyethylene sheet with a thickness of about 100 micrometers. From this, only infrared radiation is penetrated into casing 1 and the effect of the blow-off air current of the external world etc. does not attain to the heat-receiving plates 5a and 5b, temperature sensors 6a and 6b, etc.

[0020] The above-mentioned reference-temperature sensor 9 which detects the temperature of this space section is formed in the location from which it separated in the axes 8a and 8b which are in radiant heat detection section 2A covered with the infrared transparency film 11, and 2B, and pass along the focus of the reflecting mirrors 4a and 4b on either side.

[0021] In this case, the reference-temperature sensor 9 does not receive radiant heat energy from a setup of a location to the temperature sensors 6a and 6b attached in each heat-receiving plates 5a and 5b receiving radiant heat energy on either side.

[0022] Thus, between the inner skin except opening 1a of casing 1, the heat-insulating element 12 and the air thermal break 13 as a heat insulation means N are interposed radiant heat detection section 2A [ which is constituted ] and 2B rear-face side.

[0023] The above-mentioned heat-insulating element 12 consists of another soak plate 16 by which press working of sheet metal was carried out so that the rear-face side of the reflecting mirrors 4a and 4b on either side may be met, for example, so that the soak plate 14 by which press working of sheet metal was carried out may be formed, a heat insulator 15 may be put on this rear-face side and the inner skin excluding opening of casing in the perimeter of this heat insulator 15 and predetermined spacing may be further consisted with a wrap.

[0024] That is, the box which has a building envelope and which deformed is formed combining both [ which made press working of sheet metal of two sheets / the soak plate 14 and both 16 ], the building envelope is filled up with a heat insulator 15, and they are the soak plate 14 and the structure which fixed the periphery between 16.

[0025] Rib 1b— formed in the amount of protrusions same to the inside side of the above-mentioned casing 1 is prepared in one, and it is these rib 1b. — The outside above-mentioned soak plate 16 contacts the edge. Therefore, the soak plate 16 will consist predetermined spacing the inside side of casing 1, and these gaps will be formed as the above-mentioned air thermal break 13.

[0026] Thus, the radiant heat temperature sensor constituted is attached in the indoor unit of an air conditioner. From the configuration of above-mentioned radiant heat detection section 2A and 2B, these visual field range is seen from the transverse plane of an indoor unit, can be distributed to right and left, and is in agreement in the condition of having seen from the side face.

[0027] If a deer is carried out and heat is radiated from the wall surface in an air conditioned room-ed, or a floor line, the radiant heat energy will serve as infrared light, and it will be projected on it by the radiant heat temperature sensor. If it furthermore states, it will be projected on radiant heat energy to the radiant heat temperature sensor in an indoor unit from the visual field range in a wall surface and a floor line located in a line with right and left in the shape of a spot. The radiant heat energy used as infrared light penetrates the infrared transparency film 11, is projected by reflecting mirrors 4a and 4b, and is reflected in the condition of having been narrowed down to the focal location here.

[0028] It concentrates on the heat-receiving plates 5a and 5b, and the radiant heat energy reflected with reflecting mirrors 4a and 4b is incorporated, and gets across to temperature sensors 6a and 6b. The signal output of the temperature which each temperature sensor 6a and 6b detects is carried out outside through lead wire.

[0029] Such visual field range of radiant heat temperature sensor S can be freely adjusted here by setting up various whenever [ angle-of-inclination / of the axial centers 8a and 8b of the mutual reflecting mirrors 4a and 4b arranged together with right and left ], the curvature as a

parabolic mirror, diametral plane products of the heat-receiving plates 5a and 5b, and distance spacing of reflecting mirrors 4a and 4b and the heat-receiving plates 5a and 5b.

[0030] Since especially each temperature sensors 6a and 6b are arranged in the condition of having floated in the air with the heat-receiving plates 5a and 5b and are in the same air space in casing 1 with the infrared transparency film 11, even if there is a thermal effect of the metaphor exterior, they will be influenced similarly and can hold the detection precision of laterality highly.

[0031] The above-mentioned reference-temperature sensor 9 can be detected as a difference of the amount of radiant heat energy of the right-and-left visual field range which the above-mentioned temperature sensors 6a and 6b detect under a condition with the uniform thermal effect from the external world in the same space department, and the high detection value of relative precision is acquired.

[0032] Moreover, a part of radiant heat energy on which it is projected into an indoor unit from a wall surface and a floor line trespasses upon the interior as thermal disturbance from the peripheral face of the casing 1 which constitutes a radiant heat temperature sensor.

[0033] However, the air thermal break 13 is formed in casing 1, and the most is insulated here. That is, the air thermal break 13 controls the absolute magnitude of the invading thermal disturbance, and demonstrates the soak function which makes homogeneity the thermal effect to each temperature sensors 6a and 6b.

[0034] Since the heat insulator 15 with which the soak plates 14 and 16 which constitute a heat-insulating element 12, and these soak plates 14 and 16 are filled up intervenes between this air thermal break 13, and radiant heat detection section 2A and 2B, the thermal disturbance exerted on radiant heat detection section 2A and 2B is reduced to extent which can be disregarded.

[0035] This radiant heat temperature sensor is controlled to extent which can disregard the absolute magnitude of the invading thermal disturbance as a heat insulation function, and the operation which equalizes whenever [ on either side radiant heat detection section 2A and effect / on 2B ] is made as a soak function. Therefore, an always very high detection precision will be acquired.

[0036] In addition, it is also the optimal thickness of the air thermal break 13 formed here that it is [ the amount of protrusions of rib 1b in the above-mentioned example ] actual, and there should just be about 2mm. Thickness of this air thermal break 13 is not made thick beyond the need. For example, if it is the thick air space which has 5mm or more, since it will be easy to produce a heat convection and will become the minus effectiveness on the contrary, cautions are needed.

[0037] This also becomes the element which prevents enlargement of casing 1 again, and in fact, since it should just prepare rib 1b in the inside of casing 1 at one, there is almost no effect in the cost of materials and a man day.

[0038]

[Effect of the Invention] As stated above, since this invention intervened the heat insulation means equipped with the air thermal break at least between the peripheral surfaces and casing inner skin except the detection side of the radiant heat detection section of a pair, it is a comparatively simple configuration. The heat insulation function to control enlargement and a cost rise of casing and to stop the absolute magnitude of the invading thermal disturbance, and the soak function which makes homogeneity whenever [ effect / of the temperature sensor on a pair ] can be held, and the effectiveness that improvement-ization of detection precision can be attained is done so.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The front view of the radiant heat temperature sensor in which one example of this invention is shown.

[Drawing 2] The crossing top view of this radiant heat temperature sensor.

[Description of Notations]

1 [ -- An air thermal break N / -- Heat insulation means. ] -- Casing, 2A, 2B -- The radiant heat detection section, 12 -- A heat-insulating element, 13

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[Translation done.]

